

FIG.1

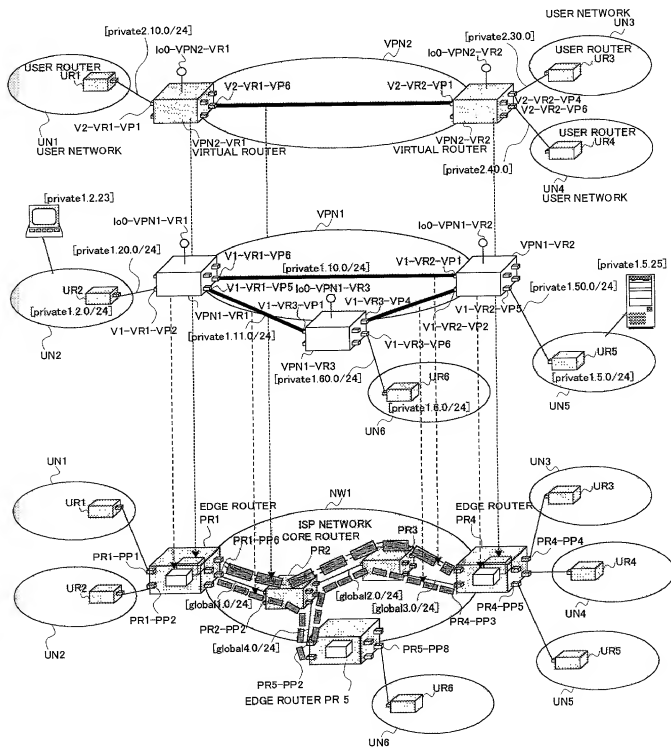


FIG.2

VIRTUAL INTERFACE NAME	IP ADDRESS
V1-VR1-VP2	private1.20.1
V1-VR1-VP5	private1.11.1
V1-VR1-VP6	private1.10.1
V1-VR2-VP1	private1.10.2
V1-VR2-VP2	private1.12.2
V1-VR2-VP5	private1.30.1
V1-VR3-VP1	private1.11.2
V1-VR3-VP4	private1.12.1
V1-VR3-VP6	private1.40.1
lo0-VPN1-VR1	private1.100.1
lo0-VPN1-VR2	private1.100.2
lo0-VPN1-VR3	private1.100.3
lo0-VPN2-VR1	private2.100.1
lo0-VPN2-VR2	private2.100.2

FIG.3

INTERFACE NAME	IP ADDRESS
PR1-PP1	private2.10.1
PR1-PP2	private1.20.1
PR1-PP6	global1.1
PR2-PP2	global1.2
PR4-PP3	global3.2
PR4-PP4	private2.30.1
PR4-PP5	private1.30.1
PR4-PP6	private2.50.1
PR5-PP2	global4.2
PR5-PP8	private1.40.1
lo0-PR1	global100.1
lo0-PR4	global100.2
lo0-PR5	global100.3

FIG.4

INTERFACE NAME	IP ADDRESS
UR1-PP1	private2.10.2
UR2-PP1	private1.20.2
UR3-PP1	private2.30.2
UR5-PP1	private2.50.2
UR6-PP1	private1.30.2

FIG. 5

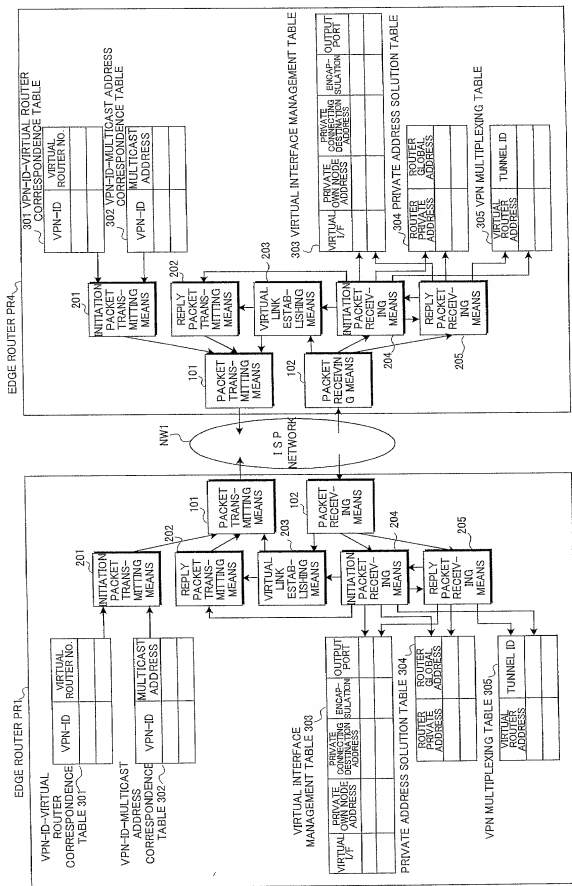


FIG.6A EDGE ROUTER PR 1

VPN-ID	VIRTUAL ROUTER
1	VPN1-VR1
2	VPN2-VR1

FIG.6B EDGE ROUTER PR 4

VPN-ID	VIRTUAL ROUTER
1	VPN1-VR2
2	VPN2-VR2

FIG.7

VPN-ID	MULTICAST ADDRESS
1	239.192.0.1
2	239.192.0.2
...	...
1024	239.192.4.0

FIG.8

IP HEADER	
MESSAGE TYPE	VPN-ID
SRC IP ADDRESS	
TUNNEL TYPE	
TUNNEL ID	
SESSION ID	
PASSWORD (MD5)	

FIG.9

MESSAGE TYPE	0
VPN-ID	1
SRC IP ADDRESS	private1.100.1
TUNNEL TYPE	0(L2TP)
TUNNEL ID	0
SESSION ID	0
PASSWORD	11111

FIG.10A UPWARD TUNNEL (PR4→PR1)

TUNNEL ID	105
SESSION ID	200

FIG.10B DOWNWARD TUNNEL (PR1→PR4)

TUNNEL ID	300
SESSION ID	202

FIG.11

MESSAGE TYPE	1
VPN-ID	1
SRC IP ADDRESS	private1.100.2
TUNNEL TYPE	0(L2TP)
TUNNEL ID	105
SESSION ID	200
PASSWORD	11111

0900950-11004

FIG.12

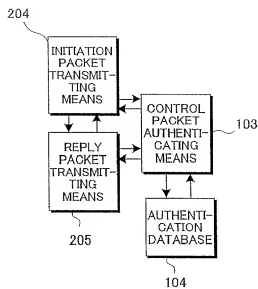


FIG. 13

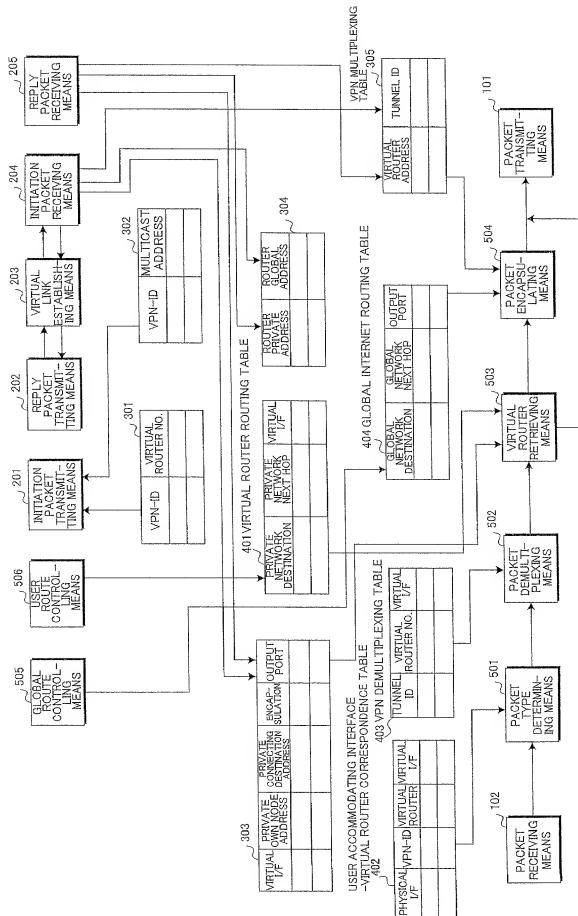


FIG.14

DESTINATION	NEXT HOP	OUTPUT PORT
global1. 0/24	Direct	PR1-PP6
global2. 0/24	global1. 2	PR1-PP6
global3. 0/24	global1. 2	PR1-PP6
global4. 0/24	global1. 2	PR1-PP6

FIG.15

DESTINATION	NEXT HOP	OUTPUT VIRTUAL INTERFACE
privatel. 6. 0/24	privatel. 100. 3	V1-VR1-VP5
privatel. 5. 0/24	privatel. 100. 2	V1-VR1-VP6
privatel. 2. 0/24	privatel. 20. 2	V1-VR1-VP2

FIG.16

PHYSICAL INTERFACE	VPN-ID	VIRTUAL ROUTER	VIRTUAL INTERFACE
PR1-PP1	2	VPN2-VR1	V2-VR1-VP1
PR1-PP2	1	VPN1-VR1	V1-VR1-VP2

FIG.17

VIRTUAL INTERFACE	OWN ADDRESS	CONNECTING DESTINATION ADDRESS	ENCAP-SULATION	OUTPUT PORT
V1-VR1-VP2	privatel.2.1	privatel.20.11	NO	PR1-PP2
V1-VR1-VP5	privatel.10.1	privatel.100.3	YES	--
V1-VR1-VP6	privatel.11.1	privatel.100.2	YES	--

FIG.18

PRIVATE ADDRESS	GLOBAL ADDRESS
privatel.100.2	global3.2
private2.100.2	global3.2
privatel.100.3	global4.2

FIG.19

CONNECTING VIRTUAL ROUTER ADDRESS	DESTINATION VIRTUAL ROUTER ADDRESS	TRANSMITTING TUNNEL ID	TRANSMITTING SESSION ID
privatel.100.2		300	202
privatel.100.3		301	243
private2.100.2		1001	1201

FIG.20

RECEIVING TUNNEL ID	RECEIVING SESSION ID	RECEIVING VIRTUAL ROUTER	VIRTUAL INTERFACE
105	200	VPN1-VR1	V1-VR1-VP6
106	201	VPN1-VR1	V1-VR1-VP5
1102	1301	VPN2-VR1	V2-VR1-VP6

00000000.11001

FIG.21
PRIOR ART

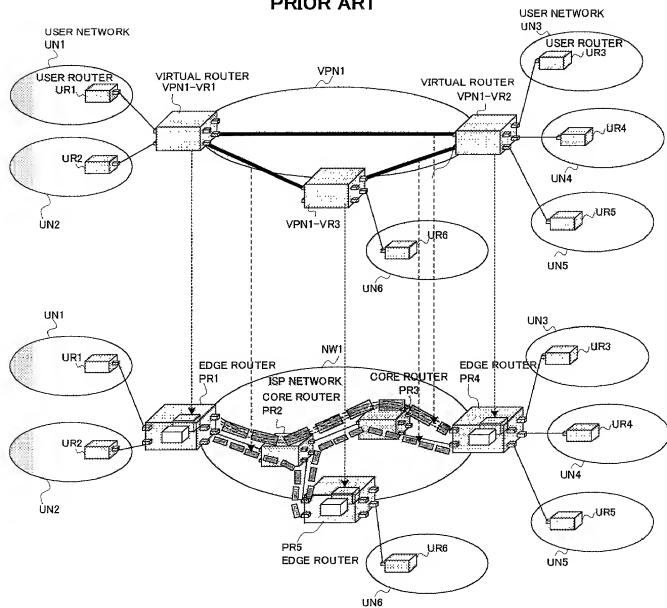


FIG.22
PRIOR ART

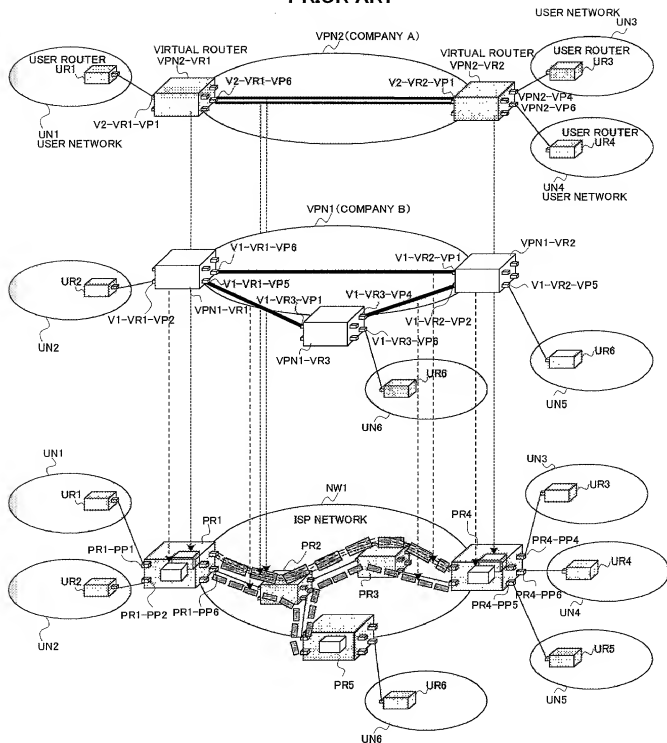


FIG.23
PRIOR ART

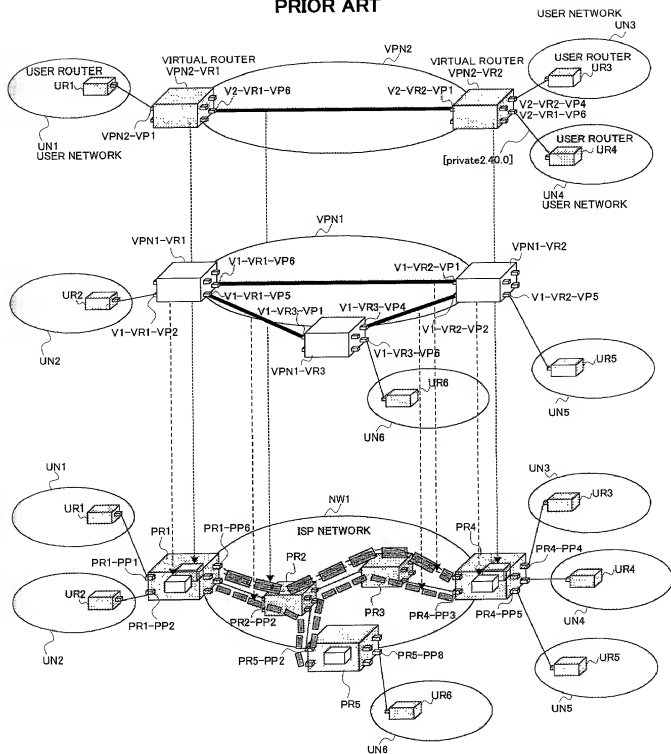


FIG.24
PRIOR ART

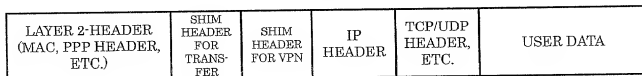


FIG.25
PRIOR ART

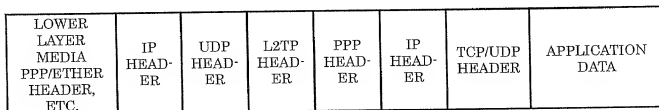


FIG.26
PRIOR ART

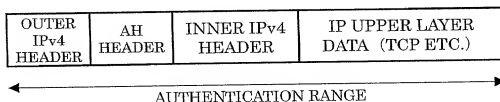


FIG.27
PRIOR ART

